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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------------|-------------|----------------------|---------------------|------------------|
| 10/698,042 | 10/29/2003 | Gregory Steintal | 041358-0285 | 1202 |
| 22428 | 7590 | 01/06/2006 | EXAMINER | |
| FOLEY AND LARDNER LLP | | | LE, TOAN M | |
| SUITE 500 | | | ART UNIT | |
| 3000 K STREET NW | | | 2863 | |
| WASHINGTON, DC 20007 | | | PAPER NUMBER | |

DATE MAILED: 01/06/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/698,042

Applicant(s)

STEINTAL ET AL.

Examiner

Toan M. Le

Art Unit

2863

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 October 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5, 8-29 and 31-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5, 8-29 and 31-37 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 June 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 12/16/05.
- ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5, 8-10, 12, 16-18, 20-24, and 34-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobsen et al. (US Patent No. 6,198,394) in view of Kovacs et al. (US Patent No. 5,833,603).

Referring to claim 1, Jacobsen et al. disclose a biological agent detection apparatus (figure 4A), comprising:

a substrate;

an array of two or more sensors arranged on the substrate, wherein at least a first one of the sensors includes a sensing element configured to detect a biological agent (col. 10, lines 54-67; figure 4A, Block 304; col. 16, lines 5-17 and lines 35-39);

a power module for supplying power to the detection apparatus (figures 4A, 5A, 6A);

a pick-up antenna (figures 4A, 5A, 6A);

a processing module directly coupled to each of the sensors and configured to process signals received from the two or more sensors to produce an output signal (col. 16, lines 24-28);
and

a communication module configured to provide information to a user in response to the output signal having a value at or above a threshold value (col. 12, lines 21-27).

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As to claim 2, Jacobsen et al. disclose a biological agent detection apparatus, wherein the processor is configured to execute a first process that detects a change in an environmental condition, and a second process that identifies an origin of the change in the environmental condition (col. 16, lines 35-39).

Referring to claim 3, Jacobsen et al. disclose a biological agent detection apparatus, wherein the second process includes a pattern recognition algorithm 420 (figure 6A).

As to claim 4, Jacobsen et al. disclose a biological agent detection apparatus, further including a communication module configured to provide the output signal to an external intelligence device (col. 14, lines 11-19; figure 6A).

Referring to claim 5, Jacobsen et al. disclose a biological agent detection apparatus, wherein the communication module includes one of a wireless interface and a physical bus interface for communicating with the external intelligence device (col. 17, lines 25-28).

As to claim 8, Jacobsen et al. disclose a biological agent detection apparatus, wherein the communication module includes one of a LED, speaker, buzzer and vibration mechanism (col. 9, lines 21-33; col. 11, lines 41-50; figure 3).

Referring to claim 9, Jacobsen et al. disclose a biological agent detection apparatus, wherein the wireless interface device includes one of an RF transmitter, an RF transceiver, an IR transmitter and an IR transceiver (figure 4A).

As to claim 10, Jacobsen et al. disclose a biological agent detection apparatus, wherein the physical bus interface includes one of an RS-232 port, a USB port and a Firewire port (figure 6A).

Referring to claim 12, Jacobsen et al. disclose a biological agent detection apparatus, wherein at least a second one of the sensors is a chemical sensor 304 (figure 4A).

As to claim 16, Jacobsen et al. disclose a biological agent detection apparatus, wherein the sensors and the processing module are integrated on the substrate (figure 4A).

Referring to claim 17, Jacobsen et al. disclose a biological agent detection apparatus, further including an attachment mechanism for allowing a user to wear the apparatus (figures 1 and 3).

As to claim 18, Jacobsen et al. disclose a biological agent detection apparatus, wherein the attachment mechanism includes one of a clip and a pin (figures 1 and 3).

Referring to claim 20, Jacobsen et al. disclose a biological agent detection apparatus, wherein the apparatus is used to diagnose a disease or determine a biological agent based on sampling the atmosphere or a bodily fluid (col. 16, lines 5-17 and lines 35-39).

As to claim 21, Jacobsen et al. disclose a biological agent detection apparatus, wherein a second one of the sensors includes a sensing element configured to detect a biological element different from the biological agent detectable by the first sensor (col. 16, lines 5-17 and lines 35-39).

Referring to claim 22, Jacobsen et al. disclose a biological agent detection apparatus, further comprising a communication module configured to communicate with an external processor (figure 6A).

As to claim 23, Jacobsen et al. disclose a biological agent detection apparatus, wherein the communication module includes a wireless transmitter device (col. 17, lines 25-28; figures 4A and 6A).

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Referring to claim 24, Jacobsen et al. disclose a biological agent detection apparatus, wherein the wireless transmitter device includes one of an RF transmitter and an IR transmitter (figures 4A and 6A).

As to claim 36, Jacobsen et al. disclose a wakeup circuitry coupled to the power module and configured to activate the two or more sensors at periodic time, and to turn off the two of more sensors at all other times (col. 16, lines 29-34).

Jacobsen et al. do not mention that the power is supplied by an external RF field received by the antenna.

Jacobsen et al. do not mention a transistor housed on the substrate and configured to reduce noise and switch resistance for the two or more sensors.

Jacobsen et al. do not mention analogue circuitry configured to provide gain, baseline tracking and radiometric sensing.

Kovacs et al. disclose a biological agent detection apparatus including a power is supplied by an external RF field received by an antenna (col. 3, lines 57-67; col. 4, lines 1-6).

Kovacs et al. also disclose a transistor housed on the substrate and configured to reduce noise and switch resistance for the two or more sensors and analogue circuitry configured to provide gain, baseline tracking and radiometric sensing (col. 15, lines 66-67; col. 16, lines 1-11).

Accordingly, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have applied the teaching of Kovacs et al. reference into the reference of Jacobsen et al. for reducing the need of battery or other source of electrical power and for filtering unwanted interference signals.

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Claims 11, 13, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobsen et al. and Kovacs et al. as applied to claims 1-5, 8-10, 12, 16-18, 20-24, and 34-36 above, and further in view of Lewis et al. (US Patent No. 6,759,010).

Referring to claims 11, 13, and 19, neither Jacobsen et al. or Kovacs et al. disclose at least two of the sensors are polymer composite sensors and wherein the sensing element of the first sensor is selected from the group consisting of a polymer composite sensor, a surface modified carbon black sensor, a sol-gel encapsulated enzyme, a biopolymer, a self assembling monolayer, an intrinsically conducting polymer, a carbon nanotube composite, a nanogold composite and a nanoscale polymer composite and is an intrinsically conducting polymer selected from the group consisting of polyaniline and polythiophene.

Lewis et al. disclose an apparatus, wherein at least two of the sensors are polymer composite sensors and wherein the sensing element of the first sensor is selected from the group consisting of a polymer composite sensor, a surface modified carbon black sensor, a sol-gel encapsulated enzyme, a biopolymer, a self assembling monolayer, an intrinsically conducting polymer, a carbon nanotube composite, a nanogold composite and a nanoscale polymer composite and is an intrinsically conducting polymer selected from the group consisting of polyaniline and polythiophene (col. 12, lines 16-34; col. 41, lines 35-41 and lines 52-53).

Accordingly, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have applied the teaching of Lewis et al. into the references of Jacobsen et al. and Kovacs et al. to improve biological/chemical agents sensors in identifying a molecule, the molecule's diffusion coefficient, and the specific activity, structure and function of the molecule detected.

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As to claims 14-15, the dimension of the apparatus is a matter of choice and would not involve patentable invention as the prior art recognizes the dimension with respect to the specification application.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 25, 28-29, and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobsen et al. (US Patent No. 6,198,394) in view of Kovacs et al. (US Patent No. 5,833,603).

Referring to claim 25, Jacobsen et al. disclose a sensor system, comprising:

a plurality of sensing devices, each device including an array of two or more sensors arranged on a substrate and a wireless communication module for remote communication (col. 10, lines 54-67; figure 4A, Block 304; col. 16, lines 5-17 and lines 35-39); and

a central processing node, located remote from said sensing devices, including a processing module and a communication module, said node being configured to receive and process signals from the plurality of sensing devices (col. 16, lines 24-28), and

wherein each sensing device includes a power source selected from the group consisting of a battery, a solar cell (col. 16, lines 24-28; figure 4A).

As to claim 28, Jacobsen et al. disclose a sensor system, wherein at least a first one of said sensing devices includes a sensor configured to detect a biologic agent (col. 16, lines 15-17 and lines 35-39).

Referring to claim 29, Jacobsen et al. disclose a sensor system, wherein at least a first one of said sensing devices includes a sensor configured to detect a chemical agent (col. 16, lines 15-17 and lines 35-39).

Jacobsen et al. do not disclose a sensor system, wherein at least one sensing device includes a power source selected from one of the RF tag module and the IR tag module, and wherein the communication module of the central processing node includes one of a corresponding RF or IR transceiver for sending a corresponding RF or IR activation signal to the at least one sensing device and for receiving an information signal from the at least one sensing device.

Kovacs et al. disclose a sensor system, wherein at least one sensing device includes a power source selected from one of the RF tag module and the IR tag module, and wherein the communication module of the central processing node includes one of a corresponding RF or IR transceiver for sending a corresponding RF or IR activation signal to the at least one sensing device and for receiving an information signal from the at least one sensing device (col. 3, lines 57-67; col. 4, lines 1-6).

Accordingly, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have applied the teaching of Kovacs et al. into the reference of Jacobsen et al. for reducing size of sensors based on the robust and low cost technologies of RF technologies.

Claims 26-27 and 32-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobsen et al. and Kovacs et al. as applied to claims 25, 28-29, and 31 above, and further in view of Lewis et al. (US Patent No. 6,759,010).

Referring to claims 26-27 and 32-33, neither Jacobsen et al. nor Kovacs et al. disclose a sensor system, wherein at least two of the sensors are polymer composite sensors and wherein the sensing element of the first sensor is selected from the group consisting of a polymer composite sensor, a surface modified carbon black sensor, a sol-gel encapsulated enzyme, a biopolymer, a self assembling monolayer, an intrinsically conducting polymer, a carbon nanotube composite, a nanogold composite and a nanoscale polymer composite and is an intrinsically conducting polymer selected from the group consisting of polyaniline and polythiophene.

Lewis et al. disclose a sensor system, wherein at least two of the sensors are polymer composite sensors and wherein the sensing element of the first sensor is selected from the group consisting of a polymer composite sensor, a surface modified carbon black sensor, a sol-gel encapsulated enzyme, a biopolymer, a self assembling monolayer, an intrinsically conducting polymer, a carbon nanotube composite, a nanogold composite and a nanoscale polymer composite and is an intrinsically conducting polymer selected from the group consisting of polyaniline and polythiophene (col. 12, lines 16-34; col. 41, lines 35-41 and lines 52-53).

Accordingly, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have applied the teaching of Lewis et al. into the reference of Jacobsen et al. to improve biological/chemical agents sensors in identifying a molecule, the molecule's diffusion coefficient, and the specific activity, structure and function of the molecule detected.

Claim Rejections - 35 USC § 103

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 37 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobsen et al. (US Patent No. 6,198,394) in view of Lewis et al. (US Patent No. 6,759,010).

Referring to claim 37, Jacobsen et al. disclose a wearable device for detection of a biological or chemical warfare agent, comprising:

a substrate;

an array of two or more sensors arranged on the substrate, wherein at least a first one of the sensors includes a sensing element configured to detect a biological agent (col. 10, lines 54-67; figure 4A, Block 304; col. 16, lines 5-17 and lines 35-39);

a processing module directly coupled to each of the sensors and configured to process signals received from the two or more sensors to produce an output signal (col. 16, lines 24-28); and

a communication module configured to provide information to a user in response to the output signal having a value at or above a threshold value (col. 12, lines 21-27).

Jacobsen et al. do not teach at least a first one of the sensors includes a sensing element containing one of a polymer composite, a surface modified carbon black sensor, a sol-gel encapsulated enzyme, a biopolymer, a self assembling monolayer, an intrinsically conducting polymer, a carbon nanotube composite, a nanogold composite and a nanoscale polymer composite.

Lewis et al. disclose a device for detection of a biological or chemical warfare agent, comprising an array of two or more sensors arranged on the substrate, wherein at least a first one of the sensors includes a sensing element containing one of a polymer composite, a surface modified carbon black sensor, a sol-gel encapsulated enzyme, a biopolymer, a self assembling monolayer, an intrinsically conducting polymer, a carbon nanotube composite, a nanogold composite and a nanoscale polymer composite (col. 12, lines 16-34; col. 41, lines 35-41 and lines 52-53).

Accordingly, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have applied the teaching of Lewis et al. into the reference of Jacobsen et al. to improve biological/chemical agents sensors in identifying a molecule, the molecule's diffusion coefficient, and the specific activity, structure and function of the molecule detected.

Response to Arguments

Applicant's arguments with respect to claims 1-5, 8-29, and 31-37 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Toan M. Le whose telephone number is (571) 272-2276. The examiner can normally be reached on Monday through Friday from 9:00 A.M. to 5:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (571) 272-2269. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Toan Le

December 27, 2005



MICHAEL NGHIEM
PRIMARY EXAMINER